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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/665,035

09/17/2003

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11/07/2007

EXAMINER

LIN, ANDY C

ART UNIT

PAPER NUMBER

4136

MAIL DATE

DELIVERY MODE

11/07/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/665,035

Applicant(s)

SUMMA ET AL.

Examiner

Andy C. Lin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) 3-6 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election of **claims 1-2** in the phone conversation initiated by examiner held on 10/30/2007 is acknowledged which supersedes the original election response filed on 10/09/2007. Accordingly, **claims 3-6** are withdrawn.

### *Claim Objections*

2. **Claim 1** is objected to because of the following informalities: both "photo sensitive" as well as "photo-sensitive" should be changed to "photosensitive", furthermore "region" is being used in reference to both the "photosensitive region" as well as the "depth region" within the "photosensitive region" so instead of "two separate regions" it should be "two separate depth regions" and "first and second separate regions" should be replaced with "first and second separate depth regions". Appropriate correction is required.

3. **Claim 2** is objected to because of the following informalities: both "photo sensitive" as well as "photo-sensitive" should be changed to "photosensitive", "associated charge-coupled devices" should be made singular into "associated charge-coupled device", "associated charge-coupled" at the very end should be replaced with "associated charge-coupled device", furthermore "region" is being used in reference to both the "photosensitive region" as well as the "depth region" within the "photosensitive

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region" so instead of "first region" it should be "first depth region" and "second region" should be replaced with "second depth region." Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 1-2** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S.

Pub. No. 2003/0189656 A1 to *Shinohara*.

As for **claim 1**, an image sensor comprising:

(a) at least first and second photosensitive regions

is disclosed by *Shinohara* (**FIG 7**);

(b) a color filter array having at least two different colors that selectively absorb specific bands of wavelengths, and the two colors respectively span portions of predetermined photosensitive regions; and wherein the two photosensitive regions are doped so that electrons released at two different depths in the substrate are collected in two separate depth regions of the photosensitive regions so that, when wavelengths of light pass through the color filter array, light is absorbed by the photosensitive regions

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which photosensitive regions consequently releases electrons at two different depths of the photosensitive regions and are stored in first and second separate depth regions

is also disclosed by *Shinohara* (**FIG 7 and 8B**, Paragraphs 0047-0054);

(c) at least two charge-coupled devices adjacent the first photosensitive regions is disclosed by *Shinohara* (**FIG 2**) where the invention is shown connected to a column line **30**;

(d) a first transfer gate associated with the first photosensitive region that selectively passes charge at first and second levels which, when at the first level, causes the charge stored in the first depth region to be passed to one of its associated charge-coupled devices, and when the transfer gate is at the second level, charge stored in the second depth region is passed to one of the associated charge-coupled devices

is also disclosed by *Shinohara* (**FIG 2**) where **22-24, 26, 28** makes up one transfer gate and shows the charges being transferred to a column line **30** and two levels being used to transfer two depth regions **TxB, TxG** and is shown to be transferring selectively at different times (**FIG 3**).

However, **Official Notice** (MPEP § 2144.03) is taken that both the concepts and advantages of using CCD shift registers for a column line of an image sensor are well known and expected in the art. At the time the invention was made, it would have been obvious to one with ordinary skill in the art to have replaced the column line of

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*Shinohara* with a CCD shift register, for doing so would create the ability to transport charge across the chip without distortion, thus process image signals of high fidelity and light sensitivity.

NOTE: It is known CCD shift registers are a plurality of CCDs and furthermore **FIG 2** shows the transfer gate connected to one point on the column line which would transfer charges to the same CCD on the CCD shift register.

As for **claim 2**, the image sensor as in claim 1 further comprising a charge-coupled device adjacent the second photosensitive regions, and a second transfer gate associated with the second photosensitive region that selectively passes charge at first and second levels which, when at the first level, causes the charge stored in the first depth region to be passed to the associated charge-coupled device, and when the transfer gate is at the second level, charge stored in the second depth region is passed to the associated charge-coupled device.

See similar rejection to claim 1 where a plurality of CCDs was mentioned, which would mean at least two, which means there would be a charge-coupled device. Claim 2 is simply the second photosensitive region of claim 1 which is disclosed by *Shinohara* (**FIG 7**) and it shown is *Shinohara* (**FIG 2**) where **22-24, 26, 28** makes up one transfer gate and shows the charges being transferred to a column line **30** and two levels being used to transfer two depth regions **TxB, TxG** and is shown to be transferring selectively at different times (**FIG 3**). Furthermore **FIG 2** shows the transfer gate connected to one

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point on the column line which would transfer charges to the same CCD on the CCD shift register.

4.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andy C. Lin whose telephone number is (571) 270-3310. The examiner can normally be reached on Monday-Friday:7:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Derrick Ferris can be reached on (571) 272-3123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/ACL/



4/4/07  
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SUPERVISORY PATENT EXAMINER